WHAT IS CLAIMED IS:

1. A receiver that recovers complex symbols transmitted through a propagation channel as modulated symbols impressed on a carrier signal and distinguished by respective channelization codes, comprising:

a path estimator that selects at least one multi-path delay for received complex symbols;

a rake processor that multiplies chips in a chip sequence with at least a corresponding channelization code based on at least one multi-path delay selected by the path estimator and generates a set of symbols corresponding to the channelization codes and multi-path delays;

a channel estimator that generates estimates of an impulse response of the propagation channel for the corresponding multi-path delay;

a combiner that multiplies symbols for a multi-path delay with complex conjugates of corresponding impulse response estimates generated by the channel estimator and reproduces the modulated symbols that were transmitted;

a decision boundary estimator/latch controller that generates estimates of a decision boundary based on reproduced modulated symbols;

a latch, wherein the latch is responsive to the decision boundary estimator/latch controller;

a soft bit value estimator that generates, for respective channelization codes, estimates of bit values of complex symbols based on the decision boundary estimates; and

a decoder;

wherein when the latch is in a first state, the decision boundary estimator generates decision boundary estimates and the soft bit value estimator does not generate soft bit values, and when the latch is in a second state, the decision boundary estimator generates decision boundary estimates and the soft bit value estimator generates soft bit values, and decision boundary estimates used for symbols from a channelization code are generated from symbols from at least one different channelization code.

2. The receiver of claim 1, wherein the receiver further comprises a Hybrid ARQ (HARQ) buffer that stores and combines generated soft bit values for retransmissions of a block until the block has been successfully decoded.

3. The receiver of claim 2, wherein the receiver further includes a deinterleaver that re-orders symbols

4. The receiver of claim 3, wherein the HARQ buffer and the deinterleaver are combined, and generated soft bit values are not removed from the HARQ buffer until either a transmitted transport block has been decoded correctly by the decoder or a removal instruction is received.

5. The receiver of claim 1, wherein the receiver receives a plurality N of channelization codes and updates decision boundary estimates every M symbols for each channelization code.

6. The receiver of claim 1, wherein the decision boundary estimate for a channelization code is generated using received symbols for the channelization code and a history of decision boundary estimates.

7. The receiver of claim 1, wherein the decision boundary estimates for a first plurality of channelization codes are generated using received symbols for the first plurality of channelization codes, a history of decision boundary estimates, and at least one of a second plurality of decision boundary estimates.

8. The receiver of claim 7, wherein the history of decision boundary estimates comprises a filtered decision boundary estimate.

9. The receiver of claim 7, wherein the decision boundary estimate for the channelization code is computed twice.

10. A method in a receiver of determining decision boundary estimates based on received symbols from one or more channelization codes, comprising the step of:

determining a decision boundary for a respective channelization code using the received symbols and at least one decision boundary estimate determined for another channelization code.

11. The method of claim 10, wherein the receiver has a combiner and a latch, and further comprising the steps of:

reading from the combiner a plurality M of symbols for a channelization code;

determining whether the channelization code is the first channelization code;

if the channelization code is the first channelization code, determining whether a latch is open or closed; and

if the latch is determined to be closed, opening the latch, running the combiner for M symbols, and computing a decision boundary estimate.

12. The method of claim 11, wherein the decision boundary estimate for a channelization code is computed using received symbols for the channelization code and a history of decision boundary estimates.

13. The method of claim 12, wherein the history of decision boundary estimates comprises a filtered decision boundary estimate.

14. The method of claim 12, wherein the decision boundary estimate for the channelization code is computed twice.

15. The method of claim 10, wherein a decision boundary estimate d_0 for a first channelization code n = 0 is given by:

$$d_0 = (1-\alpha)d_{\mathrm{filter},l} + \alpha d_\Sigma^{(0)}$$

and decision boundary estimates d_n for channelization codes n = 1, 2, . . ., N–1 are given by:

$$d_n = (1-\alpha)d_{\mathrm{filter},l} + \alpha \frac{1}{n} d_\Sigma^{(n-1)}$$

where α is a filter parameter; $d_{\mathrm{filter},\,l}$ is given by:

$$d_{\mathrm{filter},l+1} = (1-\alpha)d_{\mathrm{filter},l} + \alpha \frac{1}{N} d_\Sigma^{(N)}$$; and

$d_\Sigma^{(n)}$ is given by:

$$d_\Sigma^{(n)} = \begin{cases} \hat{d}^{(0)}, n = 0 \\ d_\Sigma^{(n-1)} + \hat{d}^{(n)}, n \neq 0 \end{cases}.$$

16. The method of claim 15, wherein the filter parameter α is one of unity, approximately min($cf_D \cdot M/160 \cdot 1500$, 1), and approximately min($cf_D \cdot M/160 \cdot 1500 + 3TTI$, 1), where c is a factor, f_D is a Doppler frequency shift, and TTI is a transmission time interval.

17. The method of claim 11, wherein the decision boundary estimates for a first plurality of channelization codes are computed using received symbols for the first plurality of channelization codes, a history of decision boundary estimates, and at least one of a second plurality of decision boundary estimates.

18. The method of claim 11, wherein a sample decision boundary $\hat{d}^{(n)}$ based on M complex symbols s from a channelization code n is given by:

$$\hat{d}^{(n)} = \frac{\kappa}{2M} \sum_{m=1}^{M} |\mathrm{Re}\, s_m| + |\mathrm{Im}\, s_m|$$

where κ is a noise-compensation factor.

19. The method of claim 18, wherein κ is 0.95.

20. The method of claim 11, further comprising the step of generating soft bit value estimates, wherein soft bit value estimates are given by:

$\hat{b}_1 = \text{Re } s$

$\hat{b}_2 = \text{Im } s$

$\hat{b}_3 = \rho(d - \text{Re } s)$ for $\text{Re } s > 0$

$\hat{b}_3 = \rho(d + \text{Re } s)$ for $\text{Re } s \leq 0$

$\hat{b}_4 = \rho(d - \text{Im } s)$ for $\text{Im } s > 0$

$\hat{b}_4 = \rho(d + \text{Im } s)$ for $\text{Im } s \leq 0$

where s is a complex symbol representing four soft bit values b1, b2, b3, b4; Re s is the real part of s; Im s is the imaginary part of s; ρ is a compensation factor; and d is the decision boundary.

21. The method of claim 20, wherein the compensation factor ρ compensates for limited resolutions of the soft bit value estimates $\hat{b}_1$, $\hat{b}_2$, $\hat{b}_3$, $\hat{b}_4$.

22. The method of claim 21, wherein ρ is 0.75.

23. The method of claim 22, wherein the decision boundary estimate for a channelization code is computed using received symbols for the channelization code and a history of decision boundary estimates.

24. The method of claim 23, wherein the history of decision boundary estimates comprises a filtered decision boundary estimate.

25. The method of claim 23, wherein the decision boundary estimate for the channelization code is computed a first time and a second time, and the soft bit values are not estimated for the first computation of the decision boundary estimate.

26. The method of claim 20, wherein the decision boundary estimates for a first plurality of channelization codes are computed using received symbols for the first plurality of channelization codes, a history of decision boundary estimates, and at least one of a second plurality of decision boundary estimates.

27. The method of claim 11, wherein if the latch is determined to be open, the latch is closed and soft bit value estimates are generated using the computed decision boundary estimate.

28. The method of claim 11, wherein if the channelization code is not the first channelization code, soft bit value estimates are generated based on at least a last-computed decision boundary estimate.

29. The method of claim 11, wherein sample decision boundary estimates are computed only for channelization codes n = 0, 1, . . ., $N_{red}-1$, where N_{red} is less than or equal to a total number of channelization codes.

30. The method of claim 10, further comprising the step of determining soft bit value estimates, wherein the soft bit value estimates are determined using received symbols and at least one decision boundary estimate determined for another channelization code.

31. A method of decision boundary estimation and soft bit value estimation, comprising the steps of:

running a combiner for M symbols of a channelization code n;

generating soft bit value estimates from an output of the combiner;

determining a sample decision boundary estimate based on the M symbols; and

updating the decision boundary estimate based on a variable $d_{\Sigma}^{(n)}$ that sums a sample decision boundary $\hat{d}^{(n)}$ over a time interval corresponding to $M \cdot N$ symbols and on a variable $d_{filter,\, l}$ that reflects a history of the variable $d_{\Sigma}^{(n)}$.

32. The method of claim 31, wherein the history comprises a filtered decision boundary estimate.

33. The method of claim 32, wherein the decision boundary estimate for the channelization code is computed twice.

34. The method of claim 31, wherein the decision boundary estimates for a first plurality of channelization codes are computed using received symbols for the first plurality of channelization codes, a history of decision boundary estimates, and at least one of a second plurality of decision boundary estimates.

35. The method of claim 31, wherein the variable $d_{\Sigma}^{(n)}$ is given by:

$$d_{\Sigma}^{(n)} = \begin{cases} 0, n = 0 \\ d_{\Sigma}^{(n-1)} + \hat{d}^{(n-1)}, n \neq 0 \end{cases}.$$

36. The method of claim 35, wherein a decision boundary estimate d_0 for a channelization code n = 0 is $d_0 = d_{filter,\, l}$, and decision boundary estimates for channelization codes n = 1, 2, . . ., N–1 are:

$$d_n = (1-\alpha)d_{filter,l} + \alpha \frac{1}{n} d_{\Sigma}^{(n-1)}$$
.

37. The method of claim 36, wherein the variable $d_{filter,l}$ is updated according to:

$$d_{filter,l+1} = (1-\alpha)d_{filter,l} + \alpha \frac{1}{N} d_{\Sigma}^{(N)}$$
where α is a filter parameter.

38. The method of claim 36, wherein the filter parameter α is one of unity, approximately $\min(cf_D \cdot M/160 \cdot 1500, 1)$, and approximately $\min(cf_D \cdot M/160 \cdot 1500 + 3TTI, 1)$, where c is a factor, f_D is a Doppler frequency shift, and TTI is a transmission time interval.

39. The method of claim 31, wherein sample decision boundary estimates are computed only for channelization codes n = 0, 1, . . ., $N_{red}-1$, where N_{red} is less than or equal to a total number of channelization codes.

40. A computer-readable medium containing a computer program for determining decision boundary estimates based on received symbols from one or more channelization codes in a receiver, wherein the computer program performs the step of:

determining a decision boundary for a respective channelization code using received symbols and at least one decision boundary estimate determined for another channelization code.

41. The computer-readable medium of claim 40, wherein the computer program further performs the step of determining soft bit value estimates, wherein the soft bit value estimates are determined using received symbols and at least one decision boundary estimate determined for another channelization code.